

What is claimed is:

1. An interactive operation supporting system for an apparatus, comprising a display unit, a speech input unit, a speech output unit and an operation control unit, wherein
5 said operation control unit includes:
 - an assistant control means for generating a personified assistant and making said assistant appear on a screen of said display unit;
 - an output speech control means for determining speech
10 required for said assistant to output said assistant's speech to the outside through said speech output unit after speech synthesis;
 - an input speech recognition means for recognizing user's voice as a speech inputted through said speech input unit;
 - 15 an interaction management means for managing interaction between said assistant and said user according to said assistant's speech determined by said output speech control means and said user speech recognized by said input speech recognition means; and
 - 20 a command interpreting means for specifying a user's intention or specifying said inputted user command based on a content of interaction traced by said interaction management means.
- 25 2. The interactive operation supporting system according to claim 1, wherein said assistant control means determines an animation of said assistant based on a content of interaction managed by said interaction management means and/or an inputted user command specified by said command interpreting means.
- 30 3. The interactive operation supporting system according

to claim 1, wherein said output speech control means determines an assistant's speech based on a content of interaction managed by said interaction management means and/or an inputted user command specified by said command interpreting means.

5

4. The interactive operation supporting system according to claim 1, wherein said output speech control means determines an assistant's speech for leading a user's intention when said command interpreting means fails to specify said user's 10 intention or said inputted user command.

5. The interactive operation supporting system according to claim 1, further comprising a connection means for connecting an external apparatus such as a television set/monitor and/or 15 a video deck to said system, wherein

 said command interpreting means also interprets a command for controlling a function of said external apparatus including selection of a broadcast program channel and/or recording/reproducing of said broadcast program.

20

6. The interactive operation supporting system according to claim 1, further comprising a communication means for connecting said system to a communication medium such as an external network or a telephone line, wherein said input speech 25 recognition means recognizes audio data received via said communication medium.

7. The interactive operation supporting system according to claim 1, further comprising a communication means for 30 connecting said system to a communication medium such as an external network and/or a telephone line, and a mail exchange

means for making an exchange of electronic mails via said communication medium, wherein said output speech control means determines said assistant's speech based on a content of an incoming mail.

5

8. The interactive operation supporting system according to claim 1, wherein said interaction management means manages an input speech of a user as a message bound for another user, and said output speech control means determines said 10 assistant's speech based on said message.

9. The interactive operation supporting system according to claim 1, wherein said assistant control means places said personified assistant in a room scattered with various kinds 15 of objects including a link to an information resource.

10. The interactive operation supporting system according to claim 1, wherein said assistant control means places said personified assistant in a room scattered with various kinds 20 of objects including a link to an information resource, and in response to an interest of said user in a recording medium including a link to a music content placed in said room, said command interpreting means interprets an inputted user command as a command for playing back said music content.

25

11. The interactive operation supporting system according to claim 1, wherein in response to said command interpreting means interpreting an inputted user command, said assistant control means makes said assistant appear on a screen of said 30 display unit.

12. The interactive operation supporting system according to claim 1, further comprising a connection means for connecting a television set/monitor to said system, and in response to said command interpreting means interpreting an inputted user command as a channel selection command, said assistant control means makes said assistant show a selected broadcasting program display window.

13. The interactive operation supporting system according
10 to claim 1, further comprising a connection means for connecting
a television set/monitor to said system, wherein in response
to said command interpreting means interpreting an inputted
user command as a channel change command, said assistant control
means placing a ring-shaped changeable broadcasting program
15 display window around said assistant.

14. The interactive operation supporting system according to claim 13, wherein, in response to selection of a desired channel by moving said display window on said ring upon a 20 channel change command from said user and said assistant control means also zooms up said selected broadcasting program display window.

15. The interactive operation supporting system according
25 to claim 1, further comprising a connection means for connecting
a secondary storage device for storing and/or reproducing a
broadcasting program content to said system, wherein in
response to said command interpreting means interpreting an
inputted user command as a recorded program reproduction
30 command, said assistant control means makes said assistant
show a binder showing a view of recorded broadcasting program

contents.

16. The interactive operation supporting system according to claim 15, wherein in response to a selection for reproducing 5 a recorded broadcasting program content, said assistant control means zooms up said selected recorded broadcasting program content display window.

17. The interactive operation supporting system according 10 to claim 1, further comprising a connection means for connecting a television set/monitor to said system, wherein in response to said command interpreting means interpreting an inputted user command as a channel change command, said assistant control means makes said assistant appear with a list of changeable 15 broadcasting programs arranged in a matrix shape.

18. The interactive operation supporting system according to claim 17, wherein in response to a selection of a desired channel, said assistant control means zooms up said selected 20 broadcasting program display window.

19. The interactive operation supporting system according to claim 17, wherein EPG distributed as part of data broadcast is applied for generating a list of broadcasting programs in 25 a matrix form.

20. The interactive operation supporting system according to claim 1, further comprising a connection means for connecting a television set/monitor to said system, a 30 communication means for connecting said system to a communication medium such as an external network and/or a

telephone line, and a mail exchange means for making exchange of electronic mails via said communication medium, wherein said assistant control means makes an incoming mail display image to appear on a screen of said display unit in response 5 to acceptance of mail.

21. The interactive operation supporting system according to claim 1, further comprising a text conversion means for converting a Japanese ideogram Kanji related to text data 10 displayed on a screen of said display unit into a corresponding phonetic character Kana.

22. The interactive operation supporting system according to claim 1, further comprising a communication means for 15 connecting said system to a communication medium such as an external network or a telephone line, and a certifying means for certifying an information terminal connected to said system via said communication medium.

20 23. The interactive operation supporting system according to claim 1, further comprising a connection means for connecting a television set/monitor to said system, and an extraction means for extracting text information from a received broadcasting program content.

25

24. The interactive operation supporting system according to claim 23, wherein text information extracted by said extraction means is superimposed on a content of another broadcasting program on said screen.

30

25. A method for supporting interactive operation of an

apparatus or other externally connected apparatus including a display unit, a speech input unit and a speech output unit, comprising:

- an assistant control step for generating a personified 5 assistant and making said generated assistant appear on a screen of said display unit;
- an output speech control step for determining a speech required for the assistant to output the assistant's speech to the outside through said speech output unit after speech 10 synthesis;
- an input speech recognition step for recognizing a user's voice as a speech inputted through said speech input unit;
- an interaction management step for managing interaction between said assistant and said user according to said 15 assistant's speech determined by said output speech control step and said user speech recognized by said input speech recognition step; and
- a command interpreting step for specifying said user's intention or specifying said inputted user command based on 20 a content of interaction traced by said interaction management step.

- 26. The method for supporting interactive operation according to claim 25, wherein said assistant control step 25 determines an animation of said assistant based on a content of interaction managed by said interaction management step and/or an inputted user command specified by said command interpreting step.
- 30 27. The method for supporting interactive operation according to claim 25, wherein said output speech control step

determines an assistant's speech based on the content of interaction managed by said interaction management step and/or an inputted user command specified by said command interpreting step.

5

28. The method for supporting interactive operation according to claim 25, wherein said output speech control step determines an assistant's speech for leading a user's intention when said command interpreting step fails to specify said user's 10 intention or said inputted user command.

29. The method for supporting interactive operation according to claim 25, wherein said apparatus further includes a connection means for connecting an external apparatus such 15 as a television set/monitor and/or a video deck to said apparatus, and said command interpreting step also interprets commands for controlling a function of said external apparatus including selection of a broadcast program and/or recording/reproducing of said broadcast program.

20

30. The method for supporting interactive operation according to claim 25, wherein said apparatus further includes a communication means for connecting said apparatus to a communication medium such as an external network and/or a 25 telephone line, and said input speech recognition step recognizes audio data received via said communication medium.

31. The method for supporting interactive operation according to claim 25, wherein said apparatus further includes 30 a communication means for connecting said apparatus to a communication medium such as an external network and/or a

telephone line, and a mail exchange means for making an exchange of electronic mails via said communication medium, said output speech control step determining said assistant's speech based on a content of an incoming mail.

5

32. The method for supporting interactive operation according to claim 25, wherein said interaction management step manages an input speech of a user as a message bound for another user, and said output speech control step 10 determines said assistant's speech based on said message.

33. The method for supporting interactive operation according to claim 25, wherein said assistant control step places said personified assistant in a room scattered with 15 various kinds of objects including a link to an information resource.

34. The method for supporting interactive operation according to claim 25, wherein said assistant control step 20 places said personified assistant in a room scattered with various kinds of objects including a link to an information resource, and in response an interest of said user in a recording medium including a link to a music content placed in said room, said command interpreting step interprets an inputted command 25 as a command for playing back said music content.

35. The method for supporting interactive operation according to claim 25, wherein in response to said command interpreting step interpreting an inputted user command, said 30 assistant control step makes said assistant appear on a screen of said display unit.

36. The method for supporting interactive operation according to claim 25, wherein said apparatus further includes a connection means for connecting a television set/monitor to said apparatus, and in response to said command interpreting step interpreting an inputted user command as a channel select command, said assistant control step makes said assistant show a selected broadcasting program display window.

10 37. The method for supporting interactive operation according to claim 25, wherein said apparatus further includes a connection means for connecting a television set/monitor to said apparatus, and in response to that said command interpreting step interpreting an inputted user command as a channel change command, said assistant control step places a changeable broadcasting program display window with a shape of a ring around said assistant.

20 38. The method for supporting interactive operation according to claim 37, wherein, in response to selection of a desired channel by moving said display window on said ring upon a channel change command from said user and said assistant control step also zooms up said selected broadcasting program display window.

25 39. The method for supporting interactive operation according to claim 25, wherein said apparatus further includes a connection means for connecting a secondary storage device for storing and/or reproducing a broadcasting program content to said apparatus, and in response to said command interpreting step interpreting an inputted user command as a recorded program

reproduction command, said assistant control step makes said assistant show a binder showing a view of recorded broadcasting program contents.

5 40. The method for supporting interactive operation according to claim 39, wherein in response to a selection for reproducing a recorded broadcasting program content, said assistant control step zooms up said selected recorded broadcasting program content display window.

10

41. The method for supporting interactive operation according to claim 25, wherein said apparatus further includes a connection means for connecting a television set/monitor to said apparatus, and in response to said command interpreting 15 step interpreting an inputted user command as a channel change command, said assistant control step makes said assistant appear with a list of changeable broadcasting programs arranged in a matrix shape.

20 42. The method for supporting interactive operation according to claim 41, wherein in response to a selection of a desired channel, said assistant control step zooms up said selected broadcasting program display window.

25 43. The method for supporting interactive operation according to claim 41, wherein EPG distributed as part of data broadcast is applied for generating a list of broadcasting programs in a matrix form.

30 44. The method for supporting interactive operation according to claim 25, wherein said apparatus further includes

a connection means for connecting a television set/monitor to said apparatus, a communication means for connecting said apparatus to a communication medium such as an external network and/or a telephone line, and a mail exchange means for making 5 exchange of electronic mails via said communication medium, and said assistant control step makes an incoming mail display image to appear on a screen of said display unit in response to acceptance of mail.

10 45. The method for supporting interactive operation according to claim 25, further comprising a text conversion step for converting a Japanese ideogram Kanji related to text data displayed on a screen of said display unit into a corresponding phonetic character Kana.

15 46. The method for supporting interactive operation according to claim 25, further comprising a communication step for connecting said apparatus to a communication medium such as an external network or a telephone line, and a certifying 20 step for certifying an information terminal connected to said apparatus via said communication medium.

47. The method for supporting interactive operation according to claim 25, wherein said apparatus further includes 25 a connection means for connecting a television set/monitor to said apparatus, and an extraction step for extracting text information from a received broadcasting program content.

30 48. The method for supporting interactive operation according to claim 47, wherein text information extracted by said extraction step is superimposed on a content of another

broadcasting program on said screen.

49. A storage medium storing a software program in computer-readable form, said software program describing an
5 interactive operation support processing for execution on a computer system, said interactive operation support processing applied to an apparatus including a display unit, a speech input unit and a speech output unit for supporting input of a user command to said apparatus and/or another
10 externally connected apparatus, wherein said software program includes:

an assistant control step for generating a personified assistant to make said generated assistant appear on a screen of said display unit;

15 an output speech control step for determining a speech required to said assistant for output of said assistant's speech to the outside through said speech output unit after speech synthesis;

20 an input speech recognition step for recognizing a user's voice inputted through said speech input unit as speech;

an interaction management step for managing interaction between said user and said assistant according to said assistant's speech determined by said output speech control step and said user speech recognized by said input speech
25 recognition step; and

a command interpreting step for specifying said user's intention or said inputted user command based on a content of interaction traced by said interaction management step.

30 50. The interactive operation supporting system according to claim 1, further comprising a code conversion means for

converting a character related to text data according to a group or system of characters or codes displayed on said display unit into a corresponding character of another group or system of characters or codes.

5

51. The method for supporting interactive operation according to claim 25, further comprising a code conversion step for converting a character related to text data according to a group or system of characters or codes displayed on said 10 display unit into a corresponding character of another group or system of characters or codes.

15

20